

DISCUSSION OF THE AMENDMENT

Claim 1 has been amended by incorporating the subject matter of Claim 14 therein. Claims 3 and 4 have been amended to depend on Claim 1. Claim 14 has been amended by rearranging two limitations and by inserting the inadvertently omitted term --to-- in step (d).

New Claims 53-62 have been added, corresponding to Claims 16 and 18-26, respectively, but dependent or ultimately dependent on Claim 1.

No new matter is believed to have been added by the above amendment. Claims 1, 3-13 and 53-62 are now active in the application. Claims 14 and 16-52 stand withdrawn from consideration.

REMARKS

The rejection of Claims 1, 7-10 and 13 under 35 U.S.C. § 102(b) as anticipated by US 6,200,923 (Garoff et al), is respectfully traversed. All of the active claims in this application now contain the limitations of Claim 2, not subject to this rejection. Accordingly, it is respectfully requested that the rejection be withdrawn.

The rejection of Claims 1 and 3-13 under 35 U.S.C. § 103(a) as unpatentable over US 6,200,923 (Garoff et al), and further in view of US 5,278,117 (Luciani et al), is respectfully traversed.

As recited in above-amended Claim 1, an embodiment of the active claims herein is a solid component of catalyst for (co)polymerization of ethylene, comprising titanium, magnesium, chlorine, an organo-oxygenated protic compound D_p, and a neutral electron-donor aprotic compound D, in the following molar ratio ranges: Mg/Ti = 1.0-50; D/Ti = 1.0-15; Cl/Ti = 6.0-100; D_p/D = 0.05-3, and additionally comprising an inert granular solid, in a quantity ranging from 10 to 90% by weight with respect to the total weight of the solid component, wherein

the solid component is prepared by a process comprising in succession:

(a) forming of a mixture and dissolution, in aprotic electron-donor compound D, of a magnesium chloride and a titanium compound having formula (I):



and adding an inert granular solid,

wherein each R³ represents a hydrocarbyl or acyl radical having from 1 to 15 carbon atoms,

each X is selected from the group consisting of chlorine, bromine and iodine; v is 3 or 4, and represents an oxidation state of titanium,

a is a number ranging from 0 to v, with a molar ratio between magnesium and titanium ranging from 1/1 to 50/1,

(b) partially separating the compound D from said mixture prepared in (a) until a residue is obtained, solid at room temperature, wherein the D/Ti ratio ranges from 1.5 to 40,

(c) forming a suspension of said solid residue in a liquid hydrocarbon medium,

(d) adding to said suspension of an organo-oxygenated protic compound D_p, in a quantity that the molar ratio D_p/D ranges from 0.1 to 1.2 and maintaining the mixture for a period varying from 5 minutes to 5 hours.

The active claims are now claimed in a product-by-process format.

As previously noted, Garoff et al discloses a composition useful for the polymerization of ethylene, propylene and other α -olefins, which composition contains magnesium, titanium, a halogen and a carboxylic acid ester in a soluble form, wherein "in a soluble form" means that the composition is soluble at least in the synthesis mixture used in its synthesis, in the titanium tetrahalide used in the synthesis, and/or in an organic dissolving substance, such as toluene, used in the synthesis, and which composition has the following formula (I): $(MgX^3_2)_xTiX^4_a(R(COOR')_n)_y$ wherein X³ is a halogen, X⁴ is a halogen, R(COOR')_n is a carboxylic acid higher alkyl ester containing at least 8·n carbon atoms, wherein R is an n-valent substituted or unsubstituted C₁-C₃₄ hydrocarbon group, R' is a C₁-C₂₀ alkyl group, and n is a number between 1 and 4, x is between 0.5 and 4, and y is between 0.8/n and 2.4/n. In formula (I), the molar amount of TiX⁴₄ is basically about 1 (paragraph bridging columns 1 and 2).

In continuing to rely on Example 3 of Garoff et al, the Examiner finds that the polymerization catalyst therein meets the molar ratio ranges in above-amended Claim 1. In so finding, the Examiner finds that the EtOH of the MgCl₂·3EtOH of Example 3 is the same as presently-recited organo-oxygenated protic compound D_p.

In reply, Applicants maintain the arguments made in traversal of this rejection in the previous response, which arguments are hereby incorporated by reference.

In that regard, the Examiner agrees that at least some of the alcohol of Garoff et al is present as alkoxide but finds that of Garoff et al's final product contains a mixture of alcohol and alkoxide, and that the solid component of catalyst of the present invention does as well.

In reply, while Claim 1 even before the above-discussed amendment distinguished the applied prior art, above-amended Claim 1 further distinguishes it. Indeed, compared to the process recited therein, the final product of Garoff et al could not be obtained by a process which includes addition of a protic compound **after formation of the catalytic solid precursor for precipitation of the compound of titanium and magnesium**. This process of preparation of the catalyst solid component is completely different from that described in Garoff et al, and strongly implies an undoubted structural difference in the products obtained. In fact, the protic compound according to the present invention, added in controlled quantities, with a ratio D_p/D comprised between 0.1 and 1.2, selectively modifies the active centers of the solid, surprisingly obtaining a catalyst particularly effective in reducing the mechanism of chain transfer during the co-polymerization process, allowing to obtain high molecular weights even at high temperatures and in the presence of high quantities of co-monomer, as it occurs for example in the fluid bed gas phase processes for the production of VLDPE.

As previously pointed out, Luciani et al is relied for the disclosure of an inert support, but does not remedy the above-discussed deficiencies of Garoff et al because it discloses and suggests nothing with regard to the presence and role of said D_p protic compound.

In sum, the applied prior art as a whole does not appreciate the key role played by D_p protic compound, added in the last step (d) of the preparation process, in improving the properties of the catalyst component, and particularly the main difference between the

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introduction of a protic compound, such as an alcohol, at the beginning of preparation, such as in Garoff et al compared to the introduction of the same compound in present step (d), after formation of a solid residue.

For all the above reasons, it is respectfully requested that this rejection be withdrawn.

All of the presently-pending claims in this application are now believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Respectfully submitted,

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